

TECHNOLOGY EVALUATION

1. REVIEWER AND TECHNOLOGY INFORMATION

Assigned Number: _____

Name of Technology: _____

Organization Name: _____

Technology Reviewer: _____

Review Focus (e.g., air, water, soil, compost, economics, engineering, overall): _____

2. WHAT DOES THE TECHNOLOGY DO?

a. Purpose of technology:

Does the technology address one or more manure management issue? ☐ Yes ☐ No

Does it improve the environment? ☐ Yes ☐ No

What media are improved? ☐ Air ☐ Water ☐ Soil

b. In your opinion, how does the technology mitigate environmental impacts?

- ☐ Pollution prevention (waste minimization, recovery, "clean technology")
☐ Conversion technology (energy, water, material, alternative fuel)
☐ Pollution control (waste management, add-on treatment, end-of-pipe treatment)
☐ Site remediation (groundwater, soil cleanup)
☐ Other (describe): _____

If this differs from the Technology Review Request Form, please explain:

c. Treatment, control, remediation, or production of environmental impacts.

Air Quality						
Environmental Impact	Claimed Effect of Technology				Do you agree with this claim?	
Ammonia (NH ₃)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Volatile organic compounds (VOC)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Hydrogen sulfide (H ₂ S)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Particulate matter (PM ₁₀ , PM _{2.5})	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Oxides of nitrogen (NO _x)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Carbon monoxide (CO)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Methane	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Carbon dioxide (CO ₂)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no

Water Quality, Soil Quality, and Trace Elements						
Environmental Impact	Claimed Effect of Technology				Do you agree with this claim?	
Nitrogen (N)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Phosphorus (P)	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Salts	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Fecal coliform	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
Salmonella	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no

Other Impacts						
Environmental Impact	Claimed Effect of Technology				Do you agree with this claim?	
Odors	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no
	<input type="checkbox"/> no effect	<input type="checkbox"/> decrease	<input type="checkbox"/> increase	<input type="checkbox"/> don't know	<input type="checkbox"/> yes	<input type="checkbox"/> no

d. In your opinion, what is the status of the technology?

- ☐ Research (basic research and applied research)
☐ Development (concept development and prototype development)
☐ Test and evaluation (product/process development)
☐ Demonstration (full or field relevant scale)
☐ Commercial application

If this differs from the Technology Review Request Form, please explain:

3. HOW DOES THE TECHNOLOGY WORK?

- a. Are the scientific and engineering terms defined and clear? ☐ Yes ☐ No

- b. Do the underlying biological, chemical, or physical principles that govern the technology's operation or performance make sense? ☐ Yes ☐ No

- c. Are there any minimum source requirements necessary for the technology to be feasible?
☐ Yes ☐ No

4. TECHNOLOGY PERFORMANCE

- a. What are the technical limits or restrictions that must be followed in order for the technology to achieve the stated performance?

- b. How long can the technology be expected to function under normal operating conditions and still achieve the specified performance?

- c. Level of performance and supporting data.

Table A: Air Quality			
	Environmental Impact	How much emissions or discharges are removed/increased from the environment? (e.g., % reduction from baseline, emission concentration achieved)	Was data provided to support the claim?
<input type="checkbox"/> N/A	Ammonia (NH ₃)		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Volatile organic compounds (VOC)		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Hydrogen sulfide		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Particulate matter		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Oxides of nitrogen		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Carbon monoxide		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Methane		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Carbon dioxide		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available

For each applicable impact in Table A, please describe the strengths and weaknesses of the performance claim(s). Where technical and/or performance information was provided to support the claim(s), please describe and assess the nature and quality of the data.

Table B: Water Quality, Soil Quality, and Trace Elements

	Environmental Impact	How much emissions or discharges are removed/increased from the environment? (e.g., % reduction from baseline, emission concentration achieved)	Was data provided to support the claim?
<input type="checkbox"/> N/A	Nitrogen (N)		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Phosphorus (P)		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Salts		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Fecal coliform		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A	Salmonella		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available

For each applicable impact in Table B, please describe the strengths and weaknesses of the performance claim(s). Where technical and/or performance information was provided to support the claim(s), please describe and assess the nature and quality of the data.

Table C: Other Impacts			
	Environmental Impact	How much emissions or discharges are removed/increased from the environment? (e.g., % reduction from baseline, emission concentration achieved)	Was data provided to support the claim?
<input type="checkbox"/> N/A	Odors		<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available
<input type="checkbox"/> N/A			<input type="checkbox"/> No data available at this time <input type="checkbox"/> Data provided <input type="checkbox"/> Data exists but is not yet available

For each applicable impact in Table C, please describe the strengths and weaknesses of the performance claim(s). Where technical and/or performance information was provided to support the claim(s), please describe and assess the nature and quality of the data.

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d. Operating Experience.

Were installations or applications (including prototypes) that can be visited provided? ☐ Yes ☐ No

Did you visit or contact any of these installations? ☐ Yes (indicate below) ☐ No

Summary of Contacts			
Size of Dairy (no. of milk-producing cows or equivalent)	Type of Manure Management (e.g., flush, scrape, vacuum)	Operational Status	Length of Operation

What significant findings did you make as a result of your visit(s) and/or phone call(s)?

5. TECHNOLOGY COST

a. Was cost data provided? ☐ Yes (indicate below) ☐ No

The following cost information was provided:

- ☐ design capacity of the pollution control equipment
- ☐ capital investment cost (including construction and installation costs)
- ☐ annual operation and maintenance costs
- ☐ estimated useful life of equipment
- ☐ products produced by treatment technology (that can offset the costs such as energy, fertilizer, and compost)

b. Was sufficient information given to evaluate the costs associated with this technology? ☐ Yes ☐ No

c. Are the economic assumptions realistic? ☐ Yes ☐ No

d. Are the installation costs reasonable? ☐ Yes ☐ No

e. Are the operating and maintenance costs reasonable? ☐ Yes ☐ No

f. If the technology yields saleable products, is the quantity of product and price of product assigned reasonable? ☐ Yes ☐ No

g. Were all assumptions made in determining the economics of the technology provided? ☐ Yes ☐ No

Additional comments:

6. OTHER INFORMATION

Check the box if the following information was provided. If the information adds to the evaluation, please describe.

☐ **Permits.**

Comments: _____

☐ **Certifications.**

Comments: _____

☐ **Warranties and/or Bonds.**

Comments: _____

☐ **Operator Requirements.**

Comments: _____

☐ **Technical References.**

Comments: _____

☐ **Other (Please specify).**

Comments: _____

7. GENERAL COMMENTS

a. Does the technology make sense for dairies in California? Please discuss below:

b. What data gaps exist?

c. What additional research and/or verification work should be done?
